

LISTING OF THE CLAIMS

1. (Previously presented) A modular apparatus for detecting a target analyte, the apparatus comprising:

a reservoir module comprising:

a fluid manifold base defining a plurality of bays and a plurality of outlets, each outlet extending between one of the plurality of bays and a lower surface of the fluid manifold base; and

a plurality of reservoirs coupled to the fluid manifold base positioned within one of the plurality of bays, wherein at least one reservoir comprises a reservoir seal and wherein at least one needle penetrates said reservoir seal;

a microfluidic chip comprising:

a planar upper surface and a planar lower surface, the planar upper surface abutting the lower surface of the fluid manifold base;

a plurality of inlets piercing the upper surface, the inlets positioned in locations corresponding to the plurality of outlets of the fluid manifold base and each in fluid communication with one of the inlets,

wherein said at least one needle is in fluidic communication with at least one inlet; and

a separation channel embedded within the microfluidic chip between the upper and lower surfaces thereof, the separation channel in fluid communication with at least one of said inlets;

a sample introduction port embedded within the microfluidic chip between the upper and lower surfaces thereof, the sample introduction port in fluid communication with said reservoir module and at least one of the plurality of inlets;

a seal positioned between the fluid manifold base and the microfluidic chip, the seal defining at least one area of fluidic communication between one of said plurality of outlets and one of said inlets;

a detection module positioned to interrogate, at least a portion of the separation channel; and

an output interface in communication with said detection module to indicate detection of the target analyte; and

a power module for providing controlled current or voltage.

**2. (Original)** A modular apparatus according to claim 1, wherein the reservoirs are each coupled to the fluid manifold base with a fitting.

**3. – 6. (Canceled)**

**7. (Currently amended)** A modular apparatus for detecting a target analyte, the apparatus comprising:

a reservoir module comprising:

a fluid manifold base; and

a plurality of reservoirs coupled to the fluid manifold base, wherein at least one reservoir comprises a reservoir seal and wherein at least one needle penetrates said reservoir seal;

a microfluidic chip comprising:

a plurality of inlets, wherein said at least one needle is in fluidic communication with at least one inlet; and

a separation channel in fluid communication with at least one of said inlets

a sample introduction port in fluid communication with said reservoir module and at least one of the plurality of inlets;

a seal positioned between the fluid manifold base and the microfluidic chip, the seal defining at least one area of fluidic communication between one of said reservoirs and one of said inlets;

a detection module positioned to interrogate at least one portion of the separation channel; and

an outlet interface in communication with said detection module to indicate detection of the target analyte; and

a power module for providing controlled current or voltage;

wherein at least one of said plurality of reservoirs comprise at least two chambers, wherein one of the at least two chambers is in fluidic communication with at least one of said plurality of inlets, and the second of said at least two chambers is in electrical communication with the power module.

**8. (Canceled)**

**9. (Previously presented)** An apparatus according to claim 1, wherein each of said plurality of reservoirs further comprises an electrode, and wherein the power module is in communication with each of said electrodes.

**10. (Original)** An apparatus according to claim 9, wherein said power module is further in communication with said detection module.

**11. (Canceled)**

**12. (Original)** An apparatus according to claim 1, wherein said microfluidic chip comprises a plurality of separation channels.

**13. (Original)** An apparatus according to claim 1, wherein said modular apparatus is portable.

**14. (Original)** An apparatus according to claim 1, wherein said modular apparatus is hand-held.

**15. (Original)** An apparatus according to claim 1, wherein the microfluidic chip, the reservoir module, the fluid manifold base, and the detection module are contained in a single housing.

**16. (Previously presented)** An apparatus according to claim 1, wherein the detection module comprises a light source.

**17. (Previously presented)** An apparatus according to claim 16, wherein the light source is a laser diode.

**18. (Original)** An apparatus according to claim 1, further comprising a plurality of microfluidic chips.

**19. (Original)** An apparatus according to claim 18, further comprising a plurality of fluid manifold bases.

**20. (Original)** An apparatus according to claim 18, wherein each of said microfluidic chips are configured to perform a different microfluidic separation.

**21. (Original)** An apparatus according to claim 1, further comprising a plurality of detection modules.

**22. – 56. (Canceled)**

**57. (Previously presented)** The modular apparatus of claim 1, further comprising a particulate filter incorporated within said sample introduction port.

**58. (Previously presented)** The modular apparatus of claim 1, wherein said power module provides a source or a sink current.

**59. – 60. (Canceled)**

61. (Previously presented) A modular apparatus for detecting a target analyte, the apparatus comprising:

a reservoir module comprising:

a fluid manifold base; and

a plurality of reservoir coupled to the fluid manifold base, wherein at least one reservoir comprises a reservoir seal and wherein at least one needle penetrates said reservoir seal;

a microfluidic chip having upper and lower surfaces, the upper surface being in contact with the fluid manifold base, the microfluidic chip comprising:

a plurality of inlets piercing the upper surface and positioned in correspondence with the plurality of reservoirs, wherein said at least one needle is in fluidic communication with at least one inlet; and

a separation channel embedded within the microfluidic chip between the upper and lower surfaces, the separation channel being in fluid communication with at least one of said inlets; and

a seal positioned between the fluid manifold base and the microfluidic chip, the seal defining at least one area of fluidic communication between one of said reservoirs and one of said inlets;

a detection module positioned to interrogate at least a portion of the separation channel; and

an output interface in communication with said detection module to indicate detection of the target analyte; and

a power module for providing controlled current or voltage.

**62. (Previously presented)** The modular apparatus of claim 61, wherein the separation channel has a circuitous shape and has a length substantially longer than a width thereof.

**63. (Previously presented)** The modular apparatus of claim 62, wherein the separation channel has as a serpentine shape.

**64. (Previously presented)** The modular apparatus of claim 61, wherein the power module is coupled to at least one of the reservoirs and the microfluidic chip to induce electroosmotic flow from the at least one reservoir into the microfluidic chip.